ABSTRACT

In this chapter, I present a model of the development of Classic Maya polities in which economy and ideology articulated to form the basis of political power. Power is manifested by the ability to acquire tribute from subjects. Many of the largest Maya polities grew in areas without lakes or rivers but with seasonal water sources such as natural rain-fed aguadas and/or swamps or bajos. At large Maya centers, rulers built immense reservoirs that would have met daily water needs during the annual dry season (January through April/May). I argue that control of water resources, symbolism and rituals during seasonal drought provided the means to amass and maintain the increasing political power evident during the Classic period (ca. A.D. 550-850) in the southern Maya lowlands. Counteracting the centripetal forces of water resources during drought, however, were the centrifugal distribution of other vital economic sources, specifically, dispersed agricultural land. In addition, standing water, if not maintained, can result in a dangerous build-up of noxious chemicals. Emerging Maya rulers associated their abilities to keep the water clean through ritual and symbolism to attract hinterland farmers and their labor.

There is an old saying in the water business: “There are two things you cannot take out of water...salt and politics” (Alexander Horne, Professor, Department of Civil and Environmental Engineering, UC-Berkeley)

The distribution of economic resources affects how people settle across the landscape and are organized socially and politically (Roscoe 1993). Concentrated critical resources (natural and/or constructed), such as alluvial land and water, result in the concentration of people, their labor, and their inability to leave (Gilman 1981; Johnson and Earle 1987:247). In contrast, when key resources are dispersed, settlement patterns can mirror this distribution. A scattered population presents unique challenges for aspiring leaders who, to increase their power, must use centripetal strategies to bring people together. Power is manifested as the ability to impose tribute demands (goods and labor). The question then becomes, how can political aspirants convince people to expand the political economy? In this chapter, I present a model of the development of Classic Maya polities in which economy and ideology articulated to form the basis of political power. Specifically, I attempt to demonstrate that control of water resources, symbolism and rituals during seasonal drought provided the means to amass and maintain the increasing political power evident during the Classic period (ca. A.D. 550-850) in the southern Maya lowlands.

Economic sources of power derive from “the ability to restrict access to key productive resources or consumptive goods” (Earle 1997:7). Ideological
sources of power derive from the ability to redefine world views and codes of social behavior to explain "why specific rights and obligations exist" (Earle 1997:8, 143; cf. Blanton et al. 1996). Together, these sources of power provided the means for emerging Maya leaders to expand the political economy beginning in the Late Preclassic period (ca. 400 B.C.-A.D. 250), specifically through water management and cosmologically based symbolism and rituals. In addition to building immense reservoirs to provide water during annual drought (January through April/May), Maya leaders sponsored large-scale ceremonies and feasts at temples, plazas and ballcourts. These events unified people physically and emotionally, and at the same time legitimized political agendas and increased the prestige of Maya elites and nascent rulers (see Bourdieu 1977:183-184, 1990:109-110; Cohen 1974:82; Earle 1997:151;

![Figure 3.1 The southern Maya lowlands. The BRASS research area is located between El Pilar, Barton Ramie and Xunantunich in west-central Belize.](image-url)
Giddens 1979:188-195, 1984:257-261). The temporary character of such events, however, required leaders to implement additional strategies that resulted in permanent and long-term benefits. To accomplish this goal, elites often incorporated features into their ceremonies that would have had society-wide significance (e.g., water purification). In addition, ceremonies typically were performed at specialized loci (e.g., temples) at specific times according to a ritual calendar. By directly associating themselves with vital natural forces of day-to-day life, Maya rulers extended their influence beyond the ceremonial events themselves. By the Early Classic period (ca. A.D. 250-550), Maya leaders became directly involved in the continuity of natural forces, including, for example, the perpetuity of rain and clean water.

**ECONOMIC POWER: WATER MANAGEMENT**

In the southern Maya lowlands, many of the largest centers and their densely settled hinterlands are located in fertile agricultural areas without permanent surface water such as lakes or rivers, but with seasonal water sources including aguadas (natural rain-fed sinkholes) and bajos (seasonal swamps) (Bronson 1978; Fedick and Ford 1990; Ford 1986). Tikal, Caracol, Calakmul, Naranjo, and El Mirador are a few examples (Figure 3.1) (see A. Chase and D. Chase 1987, 1996; Folan et al. 1995; Healy et al. 1983; Matheny 1987; Scarborough et al. 1994, 1995). The varied economic landscape of the Maya lowlands affected ancient subsistence practices and techniques, as well as settlement distribution and sociopolitical organization (Demarest 1996; Dunning et al. 1998; Fedick 1996; Pyburn 1998). This diversity also partly accounts for why anthropologists have explained ancient Maya political organization in several ways (e.g., city-states, superstates, centralized regional states, weakly centralized segmentary states, galactic polities and feudal states) (Lucero n.d.). Maya political systems are best viewed on a spectrum between small local polities and large regional ones. Rulers and elites were bound not so much by strong political ties, but through interaction with one another vis-à-vis inter-center battles, ballgames, alliances, marriage and visitations (Culbert 1991a; Demarest 1992, 1996; Fry 1990; Hammond 1991; Hirth 1992; Marcus 1976, 1993; Pohl and Pohl 1994; Sharer 1991; Webster 1998; Yoffee 1991).

I focus on Tikal (Petén, Guatemala) and its hinterlands to illustrate how complex polities developed in the southern Maya lowlands. This region has an extensive corpus of archaeological, iconographic and epigraphic data.

**Maya Settlement**

The Maya first settled along coastal areas and rivers. Beginning in the Middle Preclassic period (ca. 900-400 B.C.), they moved inland to fertile agricultural areas located in the karstic uplands like the Petén (Ford 1986:59, 80-82). The karstic hills also have aguadas, some of which can hold water year round. El Mirador and Nakbe are two well-known large Preclassic centers in the Petén; both of these centers were abandoned at the end of the Preclassic period (ca. A.D. 150) (Matheny 1987), perhaps due to a failure of their water management systems caused by the build-up of silt (Scarborough 1993; see also Dahlin 1983). The Tikal area was one of the last areas settled (Ford 1986:3-4, 1991); it is located in the uplands on a natural promontory bounded on the east and west by bajos, and on the north and south by artificial earthworks. After El Mirador's demise, Tikal, Uaxactun, and Calakmul emerged to fill the political vacuum. Tikal became the most imposing and powerful polity during the Early Classic period (ca. A.D. 250-550) (Marcus 1993; Mathews 1985) and was also home to one of the earliest stela in the region (Stela 29, dated A.D. 292) (Culbert 1991b), a feature of Maya rulership that soon spread throughout the lowlands.

The majority of Classic Maya lived in farmsteads in a dispersed manner mirroring the patch-like distribution of fertile agricultural soils (Mollisols) including both center environs and hinterlands (Fedick and Ford 1990; Lowe 1985:158; Lucero 1994; Rice 1993; Sanders 1977; Tourtellot 1993; cf. Drennan 1988). Mollisols are “...considered by agronomists to be among the world’s most important, naturally productive soils, with yields unsurpassed by other unirrigated areas” (Fedick 1988:106). Only one percent of the world’s tropical soils are Mollisols, yet they are the dominant soils of Maya lowlands. Offsetting the centrifugal, and presumably...
independent or self-sufficient, tendencies of a dispersed populace would have been a challenge for aspiring leaders. Furthermore, in the Maya area, there is a lack of evidence for elite control of agricultural systems such as canals, raised fields, or terraces (Demarest 1992; Tourtellot 1993). For example, there is currently little evidence to suggest that large-scale subsistence intensification technologies (e.g., terraces) were used near Tikal (Harrison 1993; Pohl et al. 1996; Turner 1974; cf. Harrison 1977, 1978). In contrast, Caracol, a large Classic Maya center in central Belize, is surrounded by numerous agricultural terraces (Chase and Chase 1996). The variable subsistence technologies found at Tikal and Caracol relate to local ecological variation rather than to issues of elite control (Dunning 1995; Dunning et al. 1998; e.g., Fedick 1996).

Faced with the scattered and diverse economic landscape, how did emerging leaders acquire power? Clearly, managing or controlling subsistence technology in many cases did not appear to have been an option; elites had to use other types of control. There can be little doubt that centers acted as magnets and drew in large numbers of people. One reason may have had to do with water. 

Reservoirs

In areas like the Petén with seasonal drought (especially January through April/May), water storage became critical (Ford 1996; Scarborough 1996). At many large centers, artificial reservoirs are located near monumental architecture. These capital-intensive public works required engineering know-how, both in terms of construction and maintenance. This is of particular significance to not only their upkeep, but to the disposal of human waste and the challenges of keeping standing water clean for daily drinking needs.

Scarborough and Gallopin (1991) define three types of Tikal reservoirs based on their location and amount of water contained: central precinct, residential, and bajo-margin. There are six major reservoirs at Tikal, which range in area from nine to 62 hectares. Scarborough and Gallopin estimate that the five central precinct reservoirs had a capacity of 900,000 cubic meters throughout the year, which together with other Tikal reservoirs may have been able to hold up to 40 million gallons of water (Carr and Hazard 1961; see Scarborough 1996). In addition, some of the famous causeways (sacbeob) found in many Maya centers may also have served as dams (Harrison 1993; Scarborough and Gallopin 1991). Clearly, the centralized water management system met the demands for water during drought.

Evidence suggests that at least the Palace Reservoir, one of the central precinct reservoirs, was constructed during the Early Classic period (ca. 250 B.C.-A.D. 250) when Tikal was growing in population and socio-political complexity (Harrison 1993). There are also indications that nucleation around centers during the Early Classic occurred, perhaps in reaction to competition and/or other stresses (e.g., as evident in the hinterlands between Tikal and Yaxhá) (Ford 1986:92, 1991). It was also during this period that Maya elites, especially burgeoning rulers (e.g., Curl Nose at Tikal), incorporated foreign elements from the central Mexican polity of Teotihuacan into their iconography, especially those elements relating to important deities having to do with rain and warfare (Coggins 1979; Freidel et al. 1993:296; Willey 1974).

To summarize, it appears that the majority of ancient Maya farmers largely lived in a dispersed manner. It also appears that water was scarce during most of the dry season in areas without permanent water, and that large enough reservoirs to supply drinking water during this period were located near monumental architecture. How are two seemingly disparate factors—dispersed people and concentrated water facilities—reconciled? A discussion of seasonal and residential mobility may help to answer this question.

Residential and Seasonal Mobility

The demands of a labor-intensive agricultural system can result in two forms of mobility: seasonal and residential (Ford 1991, n.d.; Tourtellot 1993). Maya farmers may have used temporary houses to live near their fields during labor intensive parts of the agricultural season, particularly during the rainy season. Evidence from extensively excavated hinterland mounds in the Belize River Archaeological Settlement Survey (BRASS) research area in west central Belize (see Figure 3.1) indicates the presence of isolated field houses located in areas with good agricultural land (Lucero 1994:197-245). The
agricultural season requires different activities at different times of the year (Ford 1991; Killion 1990). Using a single crop per year as an example, in the Lake Petén Itza region (Reina 1967), fields are first cleared (by March) and then burned about a month later at the end of the dry season. Planting occurs at the beginning of the rainy season (late April/early May) followed by a period of intense maintenance (e.g., weeding) during the rainy season when crops are growing. An additional burden, but an added inducement to stay near the fields at this busy time, is the difficulty of traveling during the rainy season. Finally, harvesting begins at the middle-to-end of the rainy season and beginning of the dry season (October/November) (e.g., McGee 1990:2; Redfield and Villa Rojas 1934:42-44; Vogt 1970).

If this was the case prehistorically, all structures may not have been inhabited year-around, despite dense occupation at centers. Undoubtedly, some of the population lived year-round in or near centers. The rest were probably mobile due to the demands of practicing a variety of agricultural techniques, especially in view of the lack of evidence for intensive-subsistence technology around many centers combined with a continued increase in population during the Late Preclassic (ca. 400 B.C. - A.D. 250) and Classic (ca. A.D. 550-850) periods. In addition, in certain areas some farmers also may have had to move to find more fertile soils, or to find new land in the face of natural population growth. Furthermore, settlement maps show Classic period farmsteads dispersed throughout the hinterlands (except in bajos areas) in areas for the most part bereft of aguadas (see survey transects in Fedick 1988; Ford 1986; Puleston 1983). When aguadas are located outside of centers, they are typically associated with monumental architecture. For example, Felipe Lanza (pers. comm. 1989), head of the Parque Nacional Tikal Vigilancia, has noted that the park has 103 aguadas, and that larger aguadas are associated with monumental architecture. Even if water did not evaporate at hinterland or non-center aguadas (and many likely did evaporate), they still could not have supported large populations through the entire dry season (Scarborough 1996). Test excavations in residential middens within the Tikal-Yaxha survey transect only yielded 12 pieces of groundstone out of approximately 14,000 artifacts (Ford 1986:Appendix III). This may indicate that the grinding of maize occurred elsewhere, perhaps near the chultunes or dry storage facilities that cluster at elite residential compounds particularly at centers for dry season consumption.

Seasonal Nucleation

To answer the question posed earlier about how it is possible to reconcile the seemingly disparate characteristics of dispersed populations and concentrated water facilities, I propose that the combined factors of seasonal drought and agricultural demands resulted in seasonal nucleation around water sources during the dry season and seasonal dispersal of many farmers during the agricultural season, a pattern particularly noticeable beginning in the Early Classic period (ca. A.D. 250-550) (see also Ford 1996). These factors are key to understanding the nature of the socio-political system, both in the development and maintenance of an elite hierarchy and the expansion of the political economy.

The very character of monumental architecture may provide indirect evidence for dry season nucleation. Maya monumental architecture is famous for its "onion-skin" construction phases representing long-term multi-seasonal projects rather than major short-term ones (Culbert 1991a; e.g., Tikal's Mundo Perdido Complex; Laporte and Fialko 1990). Scarborough (1993) aptly notes that quarrying the reservoirs would have also provided construction materials for monumental architecture. Episodic construction events likely indicate seasonal labor projects carried out during non-agricultural periods (Abrams 1994:43, 108; Reina 1967). Furthermore, chultunes (Puleston 1971; Reina and Hill 1980) cluster at centers and elite residential compounds (Ford 1991; see Carr and Hazard 1961; Puleston 1983), which may signify dry season food stores and surplus.

Another line of evidence supporting seasonal concentration around centers is hieroglyphic inscriptions. Warfare, sacrifice of captives, ball games, bloodletting rituals, accession of rulers, festivals with music and dancing, katun period-ending rites and temple dedications are all hallmarks of Classic Maya center life, many of which took place during the dry season (Aveni and Hotaling 1994; e.g., Bassie-Sweet 1991; Marcus 1992:431; Schele 1991; Schele and Freidel 1990). The public events would
have taken place at or around additional trademarks of Maya centers—imposing temples, open plazas, stelae and altars, causeways, and ballcourts.

These features define Classic Maya society. They suggest how elites not only justified and legitimized the status quo, but how they ceremonially integrated the masses for purposes of social cohesion and to allay conflict, especially at a time when differences in wealth and power were most obvious—when people were together in the dry season.

**IDEOLOGICAL POWER: WATER SYMBOLISM**

The idea of politicized or centralized water management in the Maya area is not new (e.g., Folan et al. 1995; Ford n.d., 1991, 1996; Scarborough 1991, 1993, 1996; Scarborough and Gallopin 1991; cf. Haberland 1983; Harrison 1977; Puleston 1977). What is new is the realization that purely economic reasons are inadequate in and of themselves to explain the emergence of Classic Maya political complexity. This development must be evaluated in light of the critical question of why households and/or communities just did not build water facilities themselves. If indeed households within communities could presumably expand aguadas or build their own water catchment systems, the control over critical resources alone cannot account for elite power. But why didn’t the dispersed and mobile populace build their own reservoirs? As mentioned earlier, maps of Classic period settlement show that relatively few aguadas are located outside centers and their environs. I argue that elite control of an economic resource and associated symbolism and ideology together played a key role in the development and maintenance of their power during the Early Classic. Specifically, I suggest that the elite constructed a new ideological relationship between water and their power.

Cross-culturally, rulers are often involved in and associated with fertility and purification rites where material concerns are brought into the supernatural, religious, and social realm. Rulers often have exclusive rights over technical knowledge and skills (Helms 1979:178, 1993:78-79; e.g., Geertz 1980; Lansing 1991). Because of this status, rulers are often considered semi-divine, or at least closer to the gods than the common person (Friedman and Rowlands 1978:222). This probably was the case for ancient Maya rulers, as amply attested in the iconography where they are often depicted in a variety of associations with deities, as well as in hieroglyphic inscriptions that describe their relationship to the other world (e.g., Bassie-Sweet 1991; Demarest 1992; Freidel et al. 1993; Schele and Freidel 1990).

In a recent article devoted to Maya water management and ritual, Scarborough (1998) focuses on the prevalence and importance of water in ancient Maya religion and presents a detailed discussion of iconography and other evidence associated with water and ritual: caves, springs, reservoirs located next to monumental architecture, Cauac or Witz Monster, Waterlily Monster and so on. Water was not only important for the survival of people, but also for the survival of the political system: “...elites used high-performance water ritual [in addition to water management] as manifest in the iconography to further centralize control” (Scarborough 1998:135). They accomplished this through the appropriation of traditional water rituals. Rulers also likely conducted these ceremonies at the water sources themselves—reservoirs located next to temples, places of ceremony and worship. Inscriptions reveal that fully-costumed and masked rulers for a time became specific deities through impersonation (Houston and Stuart 1996). Not surprisingly, the Maize god was one often ritually impersonated, as was the Sun god. “Another deity impersonated by Maya lords...seems to be aquatic represented as a serpent with a water-lily bound to its head” (“water serpent;” Houston and Stuart 1996:299, Fig. 9). Their success in impersonating deities may indicate their success as rulers and their ability to rule. This is not to claim that Maya farmers did not know about the properties of water. Rather, as Scarborough argues (1998), Maya rulers appropriated traditional water rituals to suit a political agenda.

**Standing Water**

Is the connection between elite control of water and associated symbolism sufficient to explain why hinterland communities did not appear to build their own water facilities? Not completely. I propose that the appropriation of water symbolism and rituals provided a key tool in the emergence of Maya rulership because of the importance of water and the
nature of standing water itself. Problems that might have arisen for the Maya during the four-month drought period concern standing water, especially as drinking water (versus water for fish ponds and agricultural fields) (see Miksic, this volume, for a discussion of water-borne diseases in Southeast Asia). Intestinal parasites would have been a concern. Standing water would have served as insect-breeding grounds for mosquitoes and other flying insects. Depictions on ancient Maya pottery vessels indicate that mosquitoes were a known pest (Harrison 1977). To kill off intestinal parasites today, the Maya boil bark of the copal tree (Protium copal) or leaves of the Jackass Bitter tree (Neurolaena lobata), as well as use the juice of the fresh fruit of the Mexican Wormseed (Chenopodium ambrosioides) (Arvigo 1994:187-188).

Another problem likely faced by the Maya was the build-up of nitrogen, phosphorus, and other metals and chemical organics in standing water (Horne n.d.). For the most part, natural wetland processes would impede the build-up of these elements and compounds enough to prevent them from being harmful or fatal to humans. One exception where nitrates can be harmful is in infants up to the age of three months. Infants lack the necessary enzymes in the digestive tract that prevent “the formation of a derivative of nitrate and the red blood pigment” (Horne n.d.:2). As a result, hemoglobin is prevented from carrying oxygen leading to suffocation and eventual death, commonly referred to as “blue baby disease” (Slawomir W. Hermanowicz, Civil and Environmental Engineering, UC-Berkeley, pers. comm. 1996). The natural wetland biosphere itself acts to purify water, which includes hydrophytic and macrophytic plants and other organisms (Hammer and Kadlec 1980; Horne n.d.; Tchobanoglous n.d.). Pondweeds, smaller plants, and their associated bacteria and algae all work together to purify water. For example, some bacteria act as “living filters” and feed on the spores of parasites and also denitrify water (Burton et al. 1979; Dinges 1976; Horne n.d.). In addition, all plants absorb nitrogen and phosphorus (especially nitrates [Nelson et al. 1980]). However, the most obvious and visible plant in the wetland biosphere is the waterlily—as a matter of fact, it can only flourish in pure or clean water, and thus is often seen as a symbol of water purification itself.

The waterlily (Genus Nymphaea, likely ampla species) requires still-bodied clear, slightly alkaline water (Lundell 1937:18, 26; Swindels 1983:16). Cloudy water, or water with too much algae, prevents waterlily growth (Horne, pers. comm. 1996). The waterlily also does not tolerate acidic conditions, nor water with too much calcium, such as limestone (Conrad 1905:116). As a consequence, murky aguadas or lakes will exhibit sparse waterlily growth. Furthermore, if the bottom sediment (where waterlily roots attach) contains too much organic matter (e.g., decomposing plants), the gases released including methane, ethylene and phenols, can be toxic to waterlilies. Waterlilies also require large amounts of nitrogenous food which is absorbed directly through the roots. In addition, the bluish undersides of lily pads restrict the passage of light “through the normal green chlorophyll into the water underneath” (Swindels 1983:17; see also Pearce 1987), thus preventing the build-up of too much algae. Waterlilies also provide food and cover for the natural predators of small flying pests such as the dragonfly (not to mention food for fish). Since macrophytic plants such as *Nymphaea* attach their roots to the bottom of aguadas, they typically are found where there is year-round water. Some of the largest reservoirs, on which archaeologists today rely to supply water needs during the dry season (e.g., Tikal and Caracol), are located in direct association with monumental architecture.

**Waterlily Symbolism**

It should not come as a surprise that waterlilies and water are symbolically associated with rulers in Classic Maya society, not because they are part of the purification process per se (Ford 1996), but because they signify when water is pure/clean. Other aquatic elements permeate Maya iconography such as fish, turtles, snails, water snakes and crocodiles; however, they are primarily associated with standing water itself (Harrison 1977; Puleston 1977; Willey 1978). The waterlily is also associated with purity, specifically as a symbol of abundance, a symbol with which rulers often linked themselves (Schele and Miller 1986:46; cf. Dahlin 1983; Willey 1978). For example, ancient Egyptian and Chinese rulers associated waterlilies with purity, immortality and truth, and Egyptian pharaohs like Ramses II were...
buried with waterlily wreaths (Swindels 1983:12-13).

The widespread spatial and temporal presence of the waterlily in Maya iconography attests to its role in ritual and its ties to rulership. The waterlily is the earliest known occurrence of plant forms in Maya iconography (Rands 1953:115) and is represented throughout the Maya area, from Chichen Itzá to Copán. *Nymphaea* pollen has been recovered from a possible elite household at the Late Preclassic site of Cerros in northern Belize, and Crane (1996) suggests that elites may have worn the flowers to symbolize their status. Maya iconography and hieroglyphic inscriptions also demonstrate the link between waterlilies and rulership. For example, Ford (1996:303) notes that *Nab Winik Makna*, or Water Lily Lords, refer to Classic Maya rulers. Waterlilies and/or associated elements are found on a number of different media linked with rulers such as stelae (e.g., the earliest depiction of water plants on Stela 1 at Tikal) (Rands 1953:115). Associated elements include, for example, the Waterlily Monster (e.g., Hellmuth 1987:Fig. 78a-c) and waterlily pads (ibid.: Figs. 78-80, 82c-d, 89, 91c-d, 97, 98d, 100a, 136d, 168, 185, 189; see Hellmuth [1987:141-142] for a description of the variety of waterlilies and associated elements). It is also significant that waterlilies are depicted as part of headdresses worn by rulers (Cortez n.d.; Rands 1953:120; e.g., Freidel et al. 1993:Fig. 5.3). They are also incorporated into the decor of monumental architecture, such as Lintel 2, Temple I, Tikal (Schele and Freidel 1990:Figs. 5.25b, 6.11). The Bonampak murals depict numerous dancers wearing masks incorporating the waterlily motif, a theme also found at Yaxchilan (Freidel et al. 1993:Fig. 5.4). Such depictions represent public performances incorporating elements of ritual, power display and entertainment.

Waterlilies are also represented on mobile objects such as the Leyden Plaque and numerous polychrome ceramics, especially vases (e.g., Reents-Budet 1994:Figs. 1.14, 1.20, 2.21, 6.8, 6.10, 6.14, 6.25, 6.27, 6.44, 6.47, 6.49). Hieroglyphic inscriptions also indicate the tie between waterlilies and the elite. For example, *Ah Nab* was a term used to refer to Maya nobility during the Classic period, and translates as “Waterlily People” (Schele and Freidel 1990:94). It is also interesting to note that the prefix, which is part of all Emblem Glyphs translates as “water group” (Marcus 1976:7-10). Rulers with names like Waterlily Lord (Tikal), Waterlily-Jaguar (Copan) and Lord Water (Caracol) further attest to the link of water and rulers. In addition, many centers that relied on reservoirs have a water element as part of their place name (e.g., Calakmul and Dos Pilas [Stuart and Houston 1994:19, 28]).

Finally, waterlilies have narcotic properties that may have been employed as a hallucinogen during rituals (Dobkin de Rios 1974; Emboden 1981). “The alkaloids apormorphine, nuciferine and normuciferines, isolated from the rhizome of *N. ampla*, may be responsible for...psychotropic activity” (Schultes and Hoffman 1992:67). The mention of waterlilies in Aztec poems as *quetzalaxochiacatl* (“the precious white flower”) in the context of aquatic plants that inebriate has led Diaz (1977) to suggest that this association may also extend back to prehistory. The use of *N. ampla* as a sacred psychotropic is supported, according to Diaz (1977), by depictions in the Bonampak murals, by its current use in the Maya highlands for recreational purposes (producing powerful hallucinatory effects), and by the presence of aporphine (analogous to apormorphine) alkaloids. For example, in urban areas of Chiapas, Mexico, raw fresh rhizomes of the waterlily are eaten to produce an altered state (Emboden 1981). Historically, *Nymphaea* has been considered a substitute for opium (Emboden 1979:12) because high enough doses provoke mind-altering episodes.

Religious specialists are known to induce a trance state to communicate with the spirit world and with deities (e.g., Durkheim 1995[1912]:228). For example, Egyptians used another species of *Nymphaea, caerulea*, to facilitate trances (Emboden 1989). These trances were important to heal patients and for elevating the individuals to “become like a god.” Examination of Maya pottery, codices, stone reliefs and murals led Emboden (1982) to suggest a ritual use of waterlilies similar to that depicted in the ancient Egyptian images found on tomb sculpture, ceramics, frescos, and papyri. Here, too, the depictions of waterlilies attest to their significance and sacredness.

As these examples demonstrate, no matter the media, there is a clear association of water and waterlilies with rulers, and hence, political power.
DISCUSSION

In this section, I present a model of how Maya rulers acquired the ability to control the labor, goods and services of others in the southern Maya lowlands, especially in areas that did not have natural permanent water sources. Ancient Maya farmers moved inland to upland areas with good soils and natural rain-fed aguadas and bajos during the Middle Preclassic (ca. 900-400 B.C.). Increasing numbers of farmers immigrating to inland areas resulted in greater demands on drinking water during seasonal drought. The earliest settlers in the Middle Preclassic built their new lives on fertile land near aguadas, and in time became established and prestigious lineages (“first founders”) (cf. McAnany 1995). The increasing concentration of people around water sources allowed those who had established themselves near a critical resource to start to build a group of supporters by requiring payment in return for access to aguadas during seasonal drought. The prestigious lineages in time became elite lineages who jockeyed amongst themselves for greater position and power. Early temples and ballcourts provided the perfect forum for competitive feasts and displays.

It would still seem, however, to have been relatively easy for people to choose to use other water sources controlled by burgeoning elites elsewhere, or to build their own. Fear of the loss of payment or tribute would have been a strong inducement for elites to persuade seasonal inhabitants to congregate around their particular water source. Attracting dispersed farmers was facilitated by elites associating themselves with the vital resource of water and its purity. Early Maya leaders appropriated traditional water rituals and performed them in large public arenas. The ceremonies served to unite the people physically and emotionally around a common concern, clean water. These events also benefited the sponsors in that the continuance of potable water became associated with nascent rulers. In exchange for their continued funding of vital water rituals, rulers received tribute in the form of staples, prestige goods and labor which was used to build public monumental architecture, maintain reservoirs, and eventually, to build private monumental palaces and shrines.

The tenuous hold of the elite actually had required more ornate and obvious means of legitimation. Hallmarks of legitimation included monumental architecture such as temples for ritual enactments, the stela and altar complex used for political propaganda, ballcourts to entertain as well as to settle inter-center disputes, and causeways serving both as dams and walkways leading from one monumental architectural complex to the next. Long-distance exchange of prestige goods also was vital in defining and legitimating Maya eliteness. Expertly flaked obsidian knives were essential in performing human sacrifice, just as stingray spines were for bloodletting rituals. Jade ear spools and pendants and carved sea-shell ornaments were used to physically distinguish the upper echelons from commoners. Elite interaction also occurred through royal visits to and from allied and secondary centers, inter-center marriage alliances, and warfare. Warfare itself was conducted during the Classic period for the most part by elites who captured high-status victims to sacrifice, which increased their prestige in the eyes of their tribute-payers.

The tenuous hold of the elite over people explains the political fluidity that existed during the Classic period (ca. A.D. 250-850). There is little doubt that Maya rulers acquired tribute; however, the costs of maintaining the flow of tribute were high and demanded the continual persuasion of the majority not to leave their fold for another powerful center with water sources, to maintain their own aguadas, or to build their own reservoirs. Thus, Maya rulers had to continually convince followers to provide tribute, and they did so through water management and associated symbolism and rituals.

Tikal’s fluctuating political history can be assessed in view of the model presented above. At the beginning of the Early Classic (ca. A.D. 250), Tikal and Uaxactun emerged as the two largest political centers (Pohl and Pohl 1994). Tikal later defeated Uaxactun in A.D. 378 and incorporated it and its populace under its rule. Tikal became primus inter pares. Teotihuacan’s influence at Tikal and elsewhere became noticeable as indicated by the appearance of distinctive talud-tablero architecture, slab-footed ceramics, and non-Maya religious and ideological elements (especially their rain god, Tlaloc, and military themes) (Coggins 1979; Freidel et al. 1993:296; Willey 1974).

Throughout the Late Classic period (ca. A.D.
550-850), competition between centers increased for control over labor (e.g., between Calakmul and Tikal). Increasing conflict is illustrated in the hieroglyphic and archaeological record at Caracol, whose rulers allied with Calakmul’s and defeated Tikal twice in the latter half of the 6th century, in A.D. 556 and 562 (Chase and Chase 1989). One of the significant aftermaths of Caracol’s defeat of Tikal was that Caracol’s leaders may have been able to attract or persuade Tikal’s supporters to nucleate around Caracol and its reservoirs. This population or labor shift resulted in Caracol’s rulers having had access to a dramatically larger labor pool which they used to defeat other centers (e.g., Naranjo). Evidence for population shifts includes (Chase and Chase 1989, 1996): 1) a dramatic increase in settlement density in and near Caracol; 2) large numbers of terraces and reservoirs that date to soon after Caracol expanded; 3) an increase in the number of houses; and 4) an increase in monumental construction. Chase and Chase (1989) estimate that population increased 325 percent over the next 130 years. That Caracol rulers had the ideological and economic power to entice a seasonal labor pool is further indicated by a decline in population at Tikal relative to what it had been previous to its defeat (Haviland 1970). Finally, certain areas around Caracol were uninhabited before the war with Tikal. Tikal and its hinterlands were not completely abandoned after their losses; evidence indicates that population in and near Tikal continued to grow in same time period as Caracol, but at a much slower rate (27.5 percent for central Tikal and 15 percent for its hinterlands).

Thus, the famous Classic period “hiatus” (A.D. 534-593, and as late as A.D. 692 at Tikal)—defined by the drop-off in stela erection and monumental construction at many large centers in the southern Maya lowlands—actually may have represented not only population shifts but labor shifts as well. In other words, rulers unable to organize large-scale construction projects during the hiatus did not have the means to attract the necessary labor. Caracol and other centers increased in scale during the hiatus due to their success in drawing in farmers. In short, Tikal lost its designation as primus inter pares, a designation that was unstable at best and that became even more so throughout the Classic period. Calakmul and Caracol, however, were not the only competing centers. Throughout the land-locked and rainfall-dependent areas, center rulers attempted to entice large labor pools in order to show who had the most power. Growing competition is recorded in the hieroglyphic inscriptions with the increasing mention of battles, inter-center ballgames, and the sacrifice of captives.

In conclusion, I have attempted to show the significance of the role of economy and ideology as sources of power for the development and maintenance of Classic Maya rulership in the southern Maya lowlands. Even though the elite controlled critical water resources, their power was tenuous because farmers had alternative options even during the dry season (e.g., support other rulers, maintain their own aguadas or build their own reservoirs). Consequently, economic explanations alone are insufficient to account for Classic Maya political power. It was their ideological association with water purification, in addition to the control of reservoirs, that provided Maya rulers the foundation on which to build and maintain their power.

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